

REMARKS

Claims 1-6, 11 and 12 are pending in the above-captioned application. By this Amendment, claims 4-6 are amended. No new matter is added by this Amendment, and this Amendment is fully supported by the Specification. It is respectfully submitted that claims 1-6, 11 and 12 are in condition for allowance in view of the amendments and remarks presented herein.

SUMMARY OF ACTION

The Office Action rejects claim 6 under 35 U.S.C. § 112, ¶ 2, as being indefinite. The Office Action also rejects claims 1-5, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated or under 35 U.S.C. § 103 as obvious by U.S. Patent Nos. 6,316,522 or 5,854,382 (each to Loomis et al.). The Office Action also rejects claims 1-3, 5, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated or under 35 U.S.C. § 103 as obvious over the Sawhney article. These rejections are respectfully traversed.

I. Rejection of Claim 6 Under 35 U.S.C. § 112, ¶ 2

The Office Action rejects claim 6 under 35 U.S.C. § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Office Action states that “[c]laim 6 refers to claim 1 for [the] definition of the macromonomer, while claim 1 does not define such macromonomer, rather it defines a crosslinked network (sic.) comprising [a] crosslinked macromonomer.”

By this Amendment, claim 6 has been amended to recite “A method for preparing the an amorphous polymeric network of claim 1, comprising irradiating a melt comprising an ABA triblock dimethacrylate macromonomer ~~as defined in claim 1~~ with UV light in order to induce crosslinking of the macromonomer.” As such, claim 6 is directed to a method of preparing the amorphous polymeric network of independent claim 1.

In view of the foregoing, withdrawal of the rejection of claim 6 under 35 U.S.C. §112, ¶ 2 is respectfully requested.

II. Rejections Under 35 U.S.C. § 102(b) or 35 U.S.C. § 103

A. Rejections Under 35 U.S.C. § 102(b)

The Office Action rejects claims 1-5, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated or under 35 U.S.C. § 103 as obvious by U.S. Patent Nos. 6,316,522 or 5,854,382 (each to Loomis et al.). The Office Action also rejects claims 1-3, 5, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated or under 35 U.S.C. § 103 as obvious over the Sawhney article.

Claims 1, 11 and 12 are independent. Claims 2-6 depend from independent claim 1.

The Office Action asserts that “[t]he disclosure of Loomis ‘382 and the Sawhney article is discussed in detail in the previous office action.” The Office Action further contends that both (sic.) Sawhney and Loomis (sic.) disclose long polylactic segments (with DP of up to 40 in Sawhney, and up to 50 in Loomis ‘382). In addition, both Sawhney and Loomis discloses crosslinking the polymers and drying (or dehydrating) the crosslinked networks, at least for determination of water uptake as per disclosure of illustrative examples, thus disclosing dry polymeric network that are of substantially the same structure as the claimed networks.” (Emphasis added). The Office Action further states that “Loomis ‘552 discloses substantially the same crosslinked polymers as Loomis ‘382, and similar illustrative example of dried networks. In addition, Loomis ‘522 discloses procedures of pre-crosslinking and post-crosslinking the polymers prior to formation of hydrogels (see, for example, top of column 10, and also illustrative example disclosing dried networks.” Finally, the Office Action states that “[w]hile the reference does not expressly address (sic.) the limitation of the newly introduced claims 11 and 12, and also that memory property of the claimed networks, it is reasonably believed that these limitation are inherently met by the disclosed dried networks as obtained from the block-copolymers having substantially the same chemical structure and molecular weights, and as obtained by substantially the same crosslinking mechanism as the networks disclosed in the instant specification.” (Emphasis added).

In this regard, the Office Action dated February 20, 2007 which is cited in the present Office Action, further asserted that “just because the references may be silent to any of the properties of the disclosed products, does not mean that the claimed property is not inherently exhibited by the disclosed products. In the instant case, the references disclose substantially

identical products as to the products disclosed in the instant application. The references, as discussed above, disclose networks that are obtained from the block-copolymers having substantially the same chemical structure and molecular weights, and as obtained by substantially the same crosslinking procedure as the networks disclosed in the instant specification. It is not seen how those products can have different properties." (Emphasis added).

With regard to the rejection under 35 U.S.C. § 102(b) based upon U.S. Patent Nos. 6,316,522, 5,854,382 and/or the Sawhney article, Applicants respectfully submit that a reference disclosing a structure that is "substantially the same" cannot anticipate under 35 U.S.C. § 102(b). In this regard, according to § 2131 of the Manual of Patent Examining Procedure ("MPEP")¹ "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)." MPEP § 2131 further indicates that "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." It is respectfully submitted that a structure that is "substantially the same" is not an "identical invention" as is required under 35 U.S.C. § 102(b).

Additionally, putting aside that a reference disclosing a structure that is "substantially the same" cannot anticipate under 35 U.S.C. § 102(b), Applicants note that the present polymers are not made from the same processes as those disclosed in the cited references and, as explained below, therefore do not have the same physical properties as the polymers of the cited references.

With regard to U.S. Patent No. 5,854,382 and in the Sawhney article, the disclosed polymer networks are prepared from aqueous crosslinkable compositions (*see, e.g.*, U.S. Patent No. 5,854,382 at Col. 3, ll. 55-57 and l. 4 of the Abstract), and become hydrogels once crosslinked (*see, e.g.*, U.S. Patent No. 5,854,382 at Col. 3, ll. 57-58 and Col. 6, ll. 26-27 and the title of the Sawhney article). According to U.S. Patent No. 5,854,382, a stable aqueous emulsion is crosslinked (same reference as above), and in the Sawhney article the crosslinking (gelation) is

1/ Applicants note that MPEP § 2131 is entitled "To Anticipate a Claim, the Reference Must Teach Every Element of the Claim." (Emphasis added).

accomplished in water under physiological conditions and in the presence of oxygen (*see* Sawhney article at p. 585, first full paragraph discussing micelles).

These specific conditions disclosed in U.S. Patent No. 5,854,382 and the Sawhney article surely influence the chemical structure of the resulting crosslinked polymers and the structure of such polymers after drying. It is therefore not only possible, but to the contrary practically sure, that the polymers obtained in U.S. Patent No. 5,854,382 and the Sawhney article will have properties different than those obtained by a different procedure—including those of the present application.

In this regard, Applicants note that the Office Action dated February 20, 2007 states that “[w]ith respect to the shapes of the disclosed networks, it is true that the references do not address the possible shapes of the networks (prior to water absorption).” The crosslinking according to the present invention “... can be achieved by means of irradiation of a melt ...” (*see ¶ [0029]* of the published application). This different method for preparing the present polymers will surely give polymers having a different structure than those resulting from the drying of the hydrogels according to U.S. Patent No. 5,854,382 and the Sawhney article. Additionally, it is also apparent from the examples of U.S. Patent No. 5,854,382 that the inherent properties of the dried hydrogels are different to the amorphous shape memory polymer networks of the present invention. For example, the tensile strength at break is 0.35 MPa for the polymer according to Example 5 of U.S. Patent No. 5,854,382, but is 0.94 to 5.44 MPa for the samples listed in of the present invention (*see ¶ [0051]* of the published application). Similarly, the elongation at break of the present polymer is 71% to 334% compared to 585% for the polymer of U.S. Patent No. 5,854,382. Simply put, the polymers of U.S. Patent No. 5,854,382 and the Sawhney article have different inherent characteristics than the polymers of the present invention despite the repeated assertions to the contrary in the present and previous Office Actions.

Finally, Applicants note that neither U.S. Patent No. 5,854,382 nor the Sawhney article discloses or suggest that any of the dried polymers disclosed therein exhibit shape memory behavior. It seems difficult to imagine that such an important, allegedly “inherent” feature of the cited polymers would have or even could have been overlooked—unless, of course, such a feature were absent in the cited polymers.

With regard to U.S. Patent No. 6,316,522, Applicants first wish reiterate the comments set forth above regarding U.S. Patent No. 5,854,382.²

U.S. Patent No. 6,316,522 is, like the other cited references, primarily directed to the production of hydrogels. U.S. Patent No. 6,316,522 discloses that a hydrogel can be directly formed in the presence of water (*see, e.g.*, Col. 3, ll. 47-53). Thus, as discussed above, it would be incorrect to conclude that the polymers of U.S. Patent No. 6,316,522 would have properties similar to those of a polymer obtained by different synthetic procedures—including those of the present application.

For example, U.S. Patent No. 6,316,522 discloses obtaining a network by crosslinking in the presence of organic solvents to form a xerogel, that is then converted into a hydrogel when exposed to a humid environment (*see* Col. 3, ll. 38-46 and ll. 56-63; and Col. 7, ll. 46-49). This procedure will strongly influence the microscopic and macroscopic structure of the obtained gel, so that its properties after drying will be different compared to the amorphous shape memory polymer networks of the present invention.

Similarly, U.S. Patent No. 6,316,522 discloses (*see* Col. 10, ll. 60-64) that certain liquid copolymer compositions can be crosslinked in the absence of any solvent, and the hydrogel can be formed thereafter. This process is also different to the present invention, wherein the crosslinking can be achieved by means of irradiation of a melt. Given that the polymers of the present invention have to be heated in order to become liquids, they are necessarily different than the polymer of this embodiment of U.S. Patent No. 6,316,522.

Additionally, although the Office Action asserts that U.S. Patent No. 6,316,522 discloses pre-crosslinking and post-crosslinking prior to the formation of hydrogels, the Office Action fails to make clear how pre-crosslinking and post-crosslinking influence the properties of the resulting polymers or, for that matter, how such actions relate to the cited Examples. In any event, such actions will affect the properties of the resulting polymers such that they will be different compared to the amorphous shape memory polymer networks of the present invention.

^{2/} In this regard, Applicants note that the Office Action states that “Loomis ‘522 discloses substantially the same crosslinked polymers as Loomis ‘382, and similar illustrative examples of dried networks.” As such, Applicants submit that the comments set forth above regarding U.S. Patent No. 5,854,382 are equally applicable as applied to U.S. Patent No. 6,316,522.

Finally, Applicants note that U.S. Patent No. 6,316,522 also fails to disclose or suggest that any of the polymers disclosed therein exhibit shape memory behavior. Again, it seems difficult to imagine that such an important, allegedly “inherent” feature of the cited polymers could be missed unless it were not present in the cited polymers.

In short, although U.S. Patent No. 6,316,522 (and, for that matter, U.S. Patent No. 5,854,382 and the Sawhney article) describes a variety of crosslinkable compositions/polymers and different ways of crosslinking the same, all of them are dissimilar from the present polymer materials. Namely, the polymers disclosed in U.S. Patent No. 6,316,522 are made by processes differing significantly than those used to prepare the polymers of the present invention, and which result in polymer compounds having significantly different micro- and macrostructures (and therefore different physical properties).

Thus, it is respectfully submitted that the polymeric networks of independent claims 1, 11 and 12 cannot be anticipated (explicitly and/or inherently) under 35 U.S.C. § 102(b) by U.S. Patent Nos. 6,316,522, 5,854,382 and/or the Sawhney article.

In view of the foregoing, withdrawal of the rejection of independent claims 1, 11 and 12 under 35 U.S.C. § 102(b) is respectfully requested.

Claims 2-6 depend from independent claim 1. As such, withdrawal of the rejections of dependent claims 2-6 under 35 U.S.C. § 102(b) is also respectfully requested for at least the reasons described above in connection with independent claim 1 and for the additional features each recites.

B. Rejections Under 35 U.S.C. § 103

With regard to the rejection under 35 U.S.C. § 103 based upon U.S. Patent Nos. 6,316,522, 5,854,382 and/or the Sawhney article, Applicants reiterate the comments set forth above regarding the rejections under 35 U.S.C. § 102(b) (*i.e.*, that the polymers of the cited references are prepared by processes different than those used to prepare the polymers of the present invention, and which result in polymers having significantly different physical properties).

In addition to the foregoing deficiencies with each of U.S. Patent Nos. 6,316,522, 5,854,382 and the Sawhney article, there is no teaching or suggestion, nor does the Office Action provide a rationale, for modifying the teachings of each of the cited references to remedy those deficiencies in

order to arrive at the networks of the present claims. Moreover, given that none of the cited references even suggests that the disclosed polymers exhibit shape memory properties indicates (a) that the polymers of the present invention are in fact different from those disclosed in the cited and references and (b) that one skilled in the art would not look to the cited references as teaching and/or suggesting polymers having the unique shape memory properties of the present invention.

Therefore, withdrawal of the rejection of claims 1-5, 11 and 12 under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

In view of the foregoing, Applicants respectfully requests reconsideration and timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1349. If a fee is required for an extension of time under 37 C.F.R. § 1.136 that is not accounted for in the enclosed transmittal, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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